

What is claimed is:

1. A method of creating a refrigerant mixture, capable of providing temperatures as low as about -154° C, comprising the steps of:

combining non-chlorofluorocarbon refrigerants to refrigerant R142b.

2. The non-chlorofluorocarbon refrigerant mixture of claim 1, comprises:

R14;

R134a;

R740; and

any one refrigerant from the group consisting of R508a and R508b.

3. The refrigerant mixture of claim 2, wherein said refrigerant R740 is about 17.8% by volume of the mixture.

4. The refrigerant mixture of claim 3, wherein said refrigerant R14 is about 18.2% by volume of the mixture.

5. The refrigerant mixture of claim 4, wherein said refrigerant R134a is about 20.8% by volume of the mixture.

6. The refrigerant mixture of claim 5, wherein said any one refrigerant from the group consisting of R508a and R508b is about 20.4% by volume of the mixture.
7. The refrigerant mixture of claim 6, wherein said refrigerant R142b is about 22.8% by volume of the mixture.
8. The refrigerant mixture of claim 2, wherein said refrigerant R740 is about 14.6 to 17.1 ounces of the mixture.
9. The refrigerant mixture of claim 8, wherein said refrigerant R14 is about 16.7 to 17.5 ounces of the mixture.
10. The refrigerant mixture of claim 9, wherein said refrigerant R134a is about 20 ounces of the mixture.
11. The refrigerant mixture of claim 10, wherein said any one refrigerant from the group consisting of R508a and R508b is about 18.2 to 19.7 ounces of the mixture.
12. The refrigerant mixture of claim 11, wherein said refrigerant R142b is about 22 ounces of the mixture.

13. A refrigerant mixture for use in a refrigeration system capable of providing temperatures as low as about -154° C, comprising:
R142b and at least four non-chlorofluorocarbon refrigerants.

14. The refrigerant mixture according to claim 13, comprises:
R14;
R740;
R134a; and
any one refrigerant from the group consisting of R508a and R508b.

15. The refrigerant mixture of claim 14, wherein said refrigerant R740 is about 17.8% by volume of the mixture.

16. The refrigerant mixture of claim 15, wherein said refrigerant R14 is about 18.2% by volume of the mixture.

17. The refrigerant mixture of claim 16, wherein said refrigerant R134a is about 20.8% by volume of the mixture.

18. The refrigerant mixture of claim 17, wherein said refrigerant from the group consisting of R508a and R508b is about 20.4% by volume of the mixture.
19. The refrigerant mixture of claim 18, wherein said refrigerant R142b is about 22.8% by volume of the mixture.
20. The refrigerant mixture of claim 14, wherein said refrigerant R740 is about 14.6 to 17.1 ounces of the mixture.
21. The refrigerant mixture of claim 20, wherein said refrigerant R14 is about 16.7 to 17.5 ounces of the mixture.
22. The refrigerant mixture of claim 21, wherein said refrigerant R134a is about 20 ounces of the mixture.
23. The refrigerant mixture of claim 22, wherein said any one refrigerant from the group consisting of R508a and R508b is about 18.2 to 19.7 ounces of the mixture.
24. The refrigerant mixture of claim 23, wherein said refrigerant R142b is about 22 ounces of the mixture.

25. A refrigeration heat exchanger section useful in circulating a substantially non-chlorofluorocarbon refrigerant mixture which comprises: a compressor means, an auxiliary condenser connected to said compressor means, a liquid/gas separator connected to said auxiliary condenser, a first condenser connected to said liquid/gas separator, a second condenser connected to said first condenser, a third condenser connected to said second condenser, and a subcooler means connected to said third condenser, wherein the improvement is characterized by:

a means for distributing a subcooled refrigerant liquid mixture from said liquid/gas separator to a first expansion means and a second expansion means for forming first and second expanded streams, respectively;

a first conduit means for returning said first expanded stream to said auxiliary condenser and said compressor; and

a second conduit means for delivering said second expanded stream to said first condenser.

26. The refrigeration heat exchanger section according to claim 25, wherein said refrigerant mixture comprises:

R14;

R134a;

R740;

R142b; and

any one refrigerant from the group consisting of R508a and R508b.

27. The refrigerant mixture of claim 26, wherein said refrigerant R740 is about 17.8% by volume of the mixture.

28. The refrigerant mixture of claim 27, wherein said refrigerant R14 is about 18.2% by volume of the mixture.

29. The refrigerant mixture of claim 28, wherein said refrigerant R134a is about 20.8% by volume of the mixture.

30. The refrigerant mixture of claim 29, wherein said any one refrigerant from the group consisting of R508a and R508b is about 20.4% by volume of the mixture.

31. The refrigerant mixture of claim 30, wherein said refrigerant R142b is about 22.8% by volume of the mixture.

32. The refrigerant mixture of claim 26, wherein said refrigerant R740 is about 14.6 to 17.1 ounces of the mixture.

33. The refrigerant mixture of claim 32, wherein said refrigerant R14 is about 16.7 to 17.5 ounces of the mixture.

34. The refrigerant mixture of claim 33, wherein said refrigerant R134a is about 20 ounces of the mixture.

35. The refrigerant mixture of claim 34, wherein said any one refrigerant from the group consisting of R508a and R508b is about 18.2 to 19.7 ounces of the mixture.

36. The refrigerant mixture of claim 35, wherein said refrigerant R142b is about 22 ounces of the mixture.